1. Find the relationship between \( e \) and \( l \) such that torsion and bending are of equal importance.

2. Having the part shown in the below figure, come up with the best design (of minimum weight) such that:
   
   (1) All forces are equally significant (assume sharp interior corners are bad)
   (2) Life - moderate
   (3) Moderate cost (make about 100 parts)
   (4) minimum weight
   (5) Generally small size (~30mm)
   (6) temp. can fluctuate between -10 and 50 degrees
   (7) 100 parts
   (8) Looks not that important
   (9) Cold rolled steel
   (10) High speed
   (11) connecting link
3. Find that the shear stress $\tau$ for a circular cross section in transverse shear is:

$$\tau = \frac{4P}{3A},$$

where $P$ is the applied load and $A$ is the cross section area.
4. Find the optimum angle $\alpha$ to minimum weight of the structure given a maximum allowable stress. Hints:
   - Consider the normal stress only
   - Ignore buckling
   - Find $W=f(\alpha)$ and optimize